Amendment to the Claims

In the Claims:

Please amend Claims 1, 2, 7, 18, 19, 45, 54, 55, 57, 74, and 79 and cancel Claims 4-6, 9, 10-13, 15-16, and 53 as follows:

1. (Currently Amended) A physiological training and evaluation simulator suitable for training and testing personnel, comprising a simulated physiological structure and an evaluation circuit including a conductive elastomer, wherein a conductive path through the evaluation circuit is complete prior to a manipulation of at least a portion of the simulated physiological structure and said evaluation circuit is configured to provide a signal when the manipulation of said at least the portion of the simulated physiological structure causes the conductive path through the evaluation circuit to be opened.

2. (Currently Amended) A physiological training and evaluation simulator suitable for training and testing personnel, comprising:

(a) a simulated physiological structure; and

(b) an evaluation circuit including a conductive elastomer, the conductive elastomer enhancing the realism of the simulator, said evaluation circuit being configured to provide a signal relating to a simulated procedure being performed on the simulated physiological structure, without requiring an electrical current to be provided by an instrument placed in contact with the evaluation circuit during the simulated procedure~~, the conductive elastomer enhancing the realism of the simulator~~.

3. (Currently Amended) The physiological training and evaluation simulator of Claim 2, wherein the evaluation circuit is configured to provide the signal when a specific portion of the simulated physiological structure is manipulated, regardless of whether such manipulation involves an instrument used to perform the simulated procedure.

4. (Previously Presented) The physiological training and evaluation simulator of Claim 2, wherein the evaluation circuit is configured to provide the signal when a change in pressure is applied to at least a portion of the simulated physiological structure.

5. (Original) The physiological training and evaluation simulator of Claim 4, wherein the evaluation circuit comprises a piezoelectric element responsive to a change in pressure.

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600 - 108th Avenue N.E., Suite 507
Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314

6. (Original) The physiological training and evaluation simulator of Claim 4, wherein the evaluation circuit comprises a capacitance based sensor, and the signal corresponds to a magnitude of the applied pressure.

7. (Currently Amended) The physiological training and evaluation simulator of Claim 2, wherein the evaluation circuit is configured to provide the signal when at least a portion of the simulated physiological structure is touched either by a user of the physiological training and evaluation simulator, or by an object used in connection with performing the simulated procedure.

8. (Original) The physiological training and evaluation simulator of Claim 7, wherein the evaluation circuit comprises a capacitance sensitive switch.

9. (Original) The physiological training and evaluation simulator of Claim 7, wherein the evaluation circuit comprises a resistance sensitive switch

10. (Original) The physiological training and evaluation simulator of Claim 7, wherein the evaluation circuit comprises a radio sensitive switch.

11. (Original) The physiological training and evaluation simulator of Claim 2, wherein the evaluation circuit is configured to provide the signal when a manipulation of at least a portion of the simulated physiological structure causes the evaluation circuit to close.

12. (Currently Amended) The physiological training and evaluation simulator of Claim 11, wherein the evaluation circuit comprises an energized portion coupled to a power supply, and a target portion disposed adjacent to the energized portion, such that the target portion is coupled to the energized portion to complete the circuit and produce the signal when an instrument is properly employed in the simulated procedure, the instrument not being coupled to a power supply at the start of the simulated procedure, the instrument being coupled to a power supply when the instrument is placed in contact with the energized portion of the evaluation circuit during the simulated procedure.

13. (Canceled)

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600 - 108th Avenue N.E., Suite 507
Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314

14. (Currently Amended) The physiological training and evaluation simulator of ~~Claim 11~~ Claim 2, wherein the evaluation circuit is incomplete at a gap in the evaluation circuit, and wherein the evaluation circuit is completed when at least one of the follows occurs:

(a) a conductive probe employed in the simulated procedure is positioned in the gap to correctly perform the simulated procedure, thereby ~~producing the signal~~ completing the path through the evaluation circuit, the conductive probe not being coupled to a source of electrical current until the conductive probe is electrically coupled to at least part of the evaluation circuit proximate the gap; and

(b) adjacent ends of the evaluation circuit are coupled together to complete the circuit.

15. (Original) The physiological training and evaluation simulator of Claim 2, wherein the evaluation circuit is configured to provide the signal when a manipulation of at least a portion of the simulated physiological structure causes the evaluation circuit to open.

16. (Original) The physiological training and evaluation simulator of Claim 2, wherein the evaluation circuit is configured to provide the signal when an instrument is in proximity to at least a portion of the simulated physiological structure.

17. (Original) The physiological training and evaluation simulator of Claim 2, further comprising a sensor coupled with the evaluation circuit, and the evaluation circuit is configured to provide the signal when the sensor indicates a change in a physical property has been detected.

18. (Currently Amended) The physiological training and evaluation simulator of ~~Claim 16~~ Claim 17, wherein the sensor is configured to detect a change in temperature.

19. (Currently Amended) The physiological training and evaluation simulator of ~~Claim 16~~ Claim 17, wherein the sensor is a chemical sensor.

20. (Original) The physiological training and evaluation simulator of Claim 2, further comprising additional evaluation circuits, each additional evaluation circuit comprising a conductive elastomer, wherein each additional evaluation circuit is configured to provide a signal when a different portion of the simulated physiological structure is manipulated during a procedure performed on the simulated physiological structure.

21. (Previously Presented) The physiological training and evaluation simulator of Claim 2, further comprising an indicator coupled to the evaluation circuit, such that in response to the signal the indicator provides an indication relating to the performance of the simulated procedure.

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Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314

22. (Original) The physiological training and evaluation simulator of Claim 21, wherein the indicator comprises a light source, light emitted by the light source providing feedback regarding the performance of the procedure.

23. (Original) The physiological training and evaluation simulator of Claim 21, wherein the indicator comprises a meter, a change in the meter providing feedback regarding the performance of the procedure.

24. (Original) The physiological training and evaluation simulator of Claim 2, wherein the simulated physiological structure is a simulated human tissue structure.

25. (Original) The physiological training and evaluation simulator of Claim 24, wherein the simulated human tissue structure comprises:

(a) at least one simulated membranous layer comprising at least one elastomeric layer; and

(b) at least one simulated sub-membranous layer comprising at least one elastomeric layer underlying a first membranous layer.

26. (Original) The physiological training and evaluation simulator of Claim 2, wherein the evaluation circuit is implemented in three dimensions.

27. (Original) The physiological training and evaluation simulator of Claim 26, wherein the evaluation circuit is implemented as a three-dimensional grid.

28. (Original) The physiological training and evaluation simulator of Claim 27, wherein the three-dimensional grid encompasses a majority of the simulated physiological structure.

29. (Original) The physiological training and evaluation simulator of Claim 2, wherein said simulated physiological structure includes a plurality of integral fluid channels, and wherein the evaluation circuit formed of the conductive elastomer is incorporated into at least some of the integral fluid channels.

30. (Original) The physiological training and evaluation simulator of Claim 29, wherein the evaluation circuit is incorporated into a wall of at least some of the fluid channels, such that the evaluation circuit provides the signal if such a wall is damaged during the simulated procedure.

31. (Original) The physiological training and evaluation simulator of Claim 2, wherein the evaluation circuit couples to a processor configured to manipulate the signal.

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Bellevue, Washington 98004
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32. (Original) The physiological training and evaluation simulator of Claim 31, wherein the simulated physiological structure comprises a physiological control element configured to produce a simulated physiological response in the simulated physiological structure, the physiological control element being coupled to the evaluation circuit so that the processor uses the evaluation circuit to control the physiological control element.

33. (Original) The physiological training and evaluation simulator of Claim 32, wherein the physiological control element comprises at least one of a servo and a pump.

34. (Original) The physiological training and evaluation simulator of Claim 31, wherein the evaluation circuit is implemented with a plurality of branches that extend throughout at least a portion of the simulated physiological structure where the simulated procedure will be performed, so that by monitoring the plurality of branches, the processor determines a three-dimensional location of an instrument during the simulated procedure.

35. (Original) The physiological training and evaluation simulator of Claim 2, wherein the simulated physiological structure comprises a simulated organ.

36. (Original) The physiological training and evaluation simulator of Claim 35, wherein the evaluation circuit comprises a pressure sensor disposed at a periphery of the simulated organ.

37. (Original) The physiological training and evaluation simulator of Claim 2, wherein the evaluation circuit is implemented as a neural network that substantially corresponds to a neural network in a physiological structure upon which the simulated physiological structure is modeled.

38. (Original) The physiological training and evaluation simulator of Claim 2, wherein the simulated physiological structure comprises a simulated joint.

39. (Original) The physiological training and evaluation simulator of Claim 38, wherein the evaluation circuit is disposed proximate to a location on the simulated joint at which a medical device will be employed in the simulated medical procedure, to evaluate whether a person performed the procedure properly.

40. (Original) The physiological training and evaluation simulator of Claim 2, wherein the simulated physiological structure comprises a simulated bone.

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Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314

41. (Original) The physiological training and evaluation simulator of Claim 40, wherein the evaluation circuit is disposed at a periphery of the simulated bone, proximate a location on the simulated bone at which a medical device will be employed in the simulated medical procedure, to evaluate whether a person performed the procedure properly.

42. (Canceled)

43. (Original) The physiological training and evaluation simulator of Claim 2, wherein the physiological training and evaluation simulator comprises a surgical trainer, and the simulated physiological structure comprises at least one of a simulated human tissue structure and a simulated organ included in the surgical trainer.

44. (Original) The physiological training and evaluation simulator of Claim 43, wherein the surgical trainer comprises:

(a) at least one simulated structure corresponding to an internal anatomical structure of a human body;

(b) an exterior cover encompassing a substantial portion of the surgical trainer, the exterior cover having at least one predefined opening defining an operative site, so that each opening is disposed adjacent to a different structure, to facilitate access to said structure; and

(c) the simulated human tissue structure is incisable, and is disposed proximate to each predefined opening, such that access to said at least one structure via the adjacent predefined opening requires making an incision in said simulated human tissue structure, an exterior surface of each simulated human tissue structure being substantially flush with respect to an outer surface of the exterior cover, each simulated human tissue structure being removable to be replaced after use, said simulated human tissue structure comprising a plurality of layers, said plurality of layers generally corresponding to layers of tissue found in a human being at a location corresponding to the operative site, and at least one of the plurality of layers including the conductive elastomer.

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Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314

45. (Currently Amended) A medical training simulator suitable for medical skills training and evaluation, the medical training model comprising a simulated physiological structure and an evaluation circuit including a conductive elastomer, the evaluation circuit including a first conductive segment and a second conductive segment disposed adjacent to each other, without being electrically coupled to each other, the first conductive segment and the second conductive segment being part of the simulated physiological structure, said evaluation circuit being configured to provide data related to proper execution of a simulated medical procedure being performed using the simulated physiological structure when the first conductive segment and the second conductive segment are placed in physical contact with each other during the simulated medical procedure, thereby completing the evaluation circuit and enabling the evaluation circuit to provide the data related to the proper execution of the simulated medical procedure.

46. (Canceled)

47. (Canceled)

48. (Currently Amended) The medical training simulator of Claim 45, wherein the evaluation circuit is configured to provide additional data in response to at least one of the following conditions:

(a) a specific portion of the simulated physiological structure is manipulated;

(b) pressure is applied to at least a portion of the simulated physiological structure;

(c) at least a portion of the simulated physiological structure is touched;

(d) a manipulation of at least a portion of the simulated physiological structure causes the evaluation circuit to close;

(e) a manipulation of at least a portion of the simulated physiological structure causes the evaluation circuit to open;

(f) a sensor coupled to the evaluation circuit detects a change in a physical property; and

(g) an instrument is placed in proximity to at least a portion of the simulated physiological structure.

49. (Currently Amended) The medical training simulator of Claim 45, further comprising a light source coupled to the evaluation circuit, such that light emitted by the light source provides an indication of [[the]] a quality with which the simulated medical procedure has been performed.

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Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314

50. (Previously Presented) The medical training simulator of Claim 49, wherein the evaluation circuit conveys a potential that triggers activation of the light source.

51. (Currently Amended) The medical training simulator of Claim 45, further comprising a simulated medical device to be used when performing the simulated medical procedure, wherein the simulated medical device includes an inductor, and wherein the evaluation circuit is configured to receive a current induced by the inductor when the simulated medical device is correctly utilized to perform the simulated medical procedure.

52. (Currently Amended) The medical training simulator of Claim 45, further comprising a simulated medical device to be used when performing the simulated medical procedure, wherein the evaluation circuit comprises a capacitance based sensor configured to provide data relating to a position of the simulated medical device relative to the simulated physiological structure during the simulated medical procedure.

53. (Currently Amended) The medical training simulator of Claim 45, wherein the ~~evaluation circuit comprises conductive portions~~ first conductive segment and the second conductive segment are separated by a non conductive ~~portion~~ segment, such that the proper execution of the simulated medical procedure requires the removal of the non conductive ~~portion~~ segment and the first conductive segment and the second conductive segment to be coupled together to complete the circuit.

54. (Currently Amended) The medical training simulator of Claim 45, wherein the ~~evaluation circuit comprises conductive portions~~ first conductive segment and the second conductive segment are separated by a gap, such that the proper execution of the simulated medical procedure requires the ~~conductive portions to be coupled~~ at least one of the first conductive segment and the second conductive segment to be repositioned and placed in contact with the other of the first conductive segment and the second conductive segment to complete the circuit.

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Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314

55. (Currently Amended) A medical training simulator suitable for medical skills training and evaluation, the medical training simulator comprising a simulated physiological structure and an evaluation circuit including a conductive elastomer, said conductive elastomer comprising a first elastomeric layer, a second elastomeric layer, and a conductor encapsulated by the first and second elastomeric layers, wherein the evaluation circuit is configured to provide data in response to at least one of the following conditions:

(a) a specific portion of the simulated physiological structure is manipulated without using an instrument configured to introduce an electrical current into the evaluation circuit;

(b) pressure is applied to at least a portion of the simulated physiological structure without using an instrument configured to introduce an electrical current into the evaluation circuit;

(c) at least a portion of the simulated physiological structure is touched without using an instrument configured to introduce an electrical current into the evaluation circuit;

(d) a manipulation of at least a portion of the simulated physiological structure causes a conductive path of the evaluation circuit to be completed, without using an instrument configured to introduce an electrical current into the evaluation circuit;

(e) a manipulation of at least a portion of the simulated physiological structure causes the conductive path of the evaluation circuit to be opened;

(f) a sensor coupled to the evaluation circuit detects a change in a non-electrical physical property; and

(g) an instrument is placed in proximity to at least a portion of the simulated physiological structure, the instrument not being configured to introduce an electrical current into the evaluation circuit.

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600 - 108th Avenue N.E., Suite 507
Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314

56. (Currently Amended) The medical training simulator of Claim 55, wherein the evaluation circuit is distributed throughout at least a portion of the simulated physiological structure as a three dimensional grid ~~configured to provide data in response to at least one of the following conditions:~~

~~(a) a specific portion of the simulated physiological structure is manipulated;~~

~~(b) pressure is applied to at least a portion of the simulated physiological structure;~~

~~(c) at least a portion of the simulated physiological structure is touched;~~

~~(d) a manipulation of at least a portion of the simulated physiological structure causes the evaluation circuit to close;~~

~~(e) a manipulation of at least a portion of the simulated physiological structure causes the evaluation circuit to open;~~

~~(f) a sensor coupled to the evaluation circuit detects a change in a physical property; and~~

~~(g) an instrument is placed in proximity to at least a portion of the simulated physiological structure~~.

57. (Currently Amended) A method for making a medical training simulator suitable for medical skills training and evaluation, the method comprising the steps of:

(a) determining a physiological structure that the medical training simulator is to simulate;

(b) determining a simulated medical procedure that will be performed on a simulated physiological structure corresponding to the physiological structure; and

(c) constructing a medical training simulator including:

(i) a simulated physiological structure corresponding to the physiological structure of step (a); and

(ii) an evaluation circuit comprising a conductive elastomer, the evaluation circuit being configured to provide feedback relating to the simulated medical procedure of step (b), such that the evaluation circuit provides the feedback without the input of an electrical current received from an instrument employed in the simulated medical procedure.

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Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314

58. (Original) The method of Claim 57, wherein the step of constructing the medical training simulator comprises the step of applying the evaluation circuit proximate to a location on the simulated physiological structure at which the simulated medical procedure is performed, to evaluate if a person performed the simulated medical procedure properly.

59. (Original) The method of Claim 58, wherein the step of applying the evaluation circuit comprises the step of incorporating the evaluation circuit proximate to a periphery of the simulated physiological structure.

60. (Original) The method of Claim 57, wherein the step of constructing the medical training simulator comprises the step of configuring the evaluation circuit to provide data in response to at least one of the following conditions:

(a) a specific portion of the simulated physiological structure is manipulated;

(b) pressure is applied to at least a portion of the simulated physiological structure;

(c) at least a portion of the simulated physiological structure is touched;

(d) a manipulation of at least a portion of the simulated physiological structure causes the evaluation circuit to close;

(e) a manipulation of at least a portion of the simulated physiological structure causes the evaluation circuit to open;

(f) a sensor coupled to the evaluation circuit detects a change in a physical property; and

(g) an instrument is placed in proximity to at least a portion of the simulated physiological structure.

61. (Previously Presented) The method of Claim 57, wherein the step of constructing the medical training simulator comprises the step of configuring the evaluation circuit to include an indicator that provides an indication of whether the medical device is properly utilized to perform the simulated medical procedure.

62.-73. (Canceled)

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600 - 108th Avenue N.E., Suite 507
Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314

74. (Currently Amended) A method for using a medical training simulator for medical skills training and evaluation, comprising the steps of:

(a) providing a medical training simulator comprising a simulated physiological structure a conductive elastomer-based evaluation circuit configured to evaluate a simulated medical procedure; and

(b) using the conductive elastomer-based evaluation circuit to monitor a person's performance of the simulated medical procedure ~~producing~~, wherein the evaluation circuit produces an indication of the performance without using an electrical input received from an instrument when the instrument contacts the evaluation circuit during the simulated medical procedure.

75. (Original) The method of Claim 74, wherein the indication produced by the conductive elastomer-based evaluation circuit is provided to another party, so that the person is unaware of the indication during the execution of the simulated medical procedure.

76. (Original) The method of Claim 74, wherein the indication produced by the conductive elastomer-based evaluation circuit is used to provide at least one of a visual and an audible feedback to the person during the execution of the simulated medical procedure.

77. (Original) The method of Claim 74, wherein the indication produced by the conductive elastomer-based evaluation circuit is used to determine a rate of learning.

78. (Original) The method of Claim 74, wherein the indication produced by the conductive elastomer-based evaluation circuit is used to determine a physiological response for the medical training simulator to emulate.

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600 - 108th Avenue N.E., Suite 507
Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314

79. (Currently Amended) A physiological training and evaluation simulator system for training and testing personnel, comprising:

(a) a simulated physiological structure including a conductive elastomer-based evaluation circuit configured to provide data relating to a simulated procedure being performed on the simulated physiological structure without using an electrical input received from an instrument when the instrument contacts the evaluation circuit during the simulated medical procedure; and

(b) a controller coupled to the conductive elastomer-based evaluation circuit, the controller being configured to implement a plurality of functions, including:

(i) storing data obtained from the conductive elastomer-based evaluation circuit, and

(ii) processing the data obtained from the conductive elastomer-based evaluation circuit to determine a score rating a quality of the simulated procedure.

80. (Original) The physiological training and evaluation simulator system of Claim 79, wherein the processor is further configured to implement the function of comparing the score for the simulated procedure to at least one score from a previous simulated procedure.

81. (Original) The physiological training and evaluation simulator system of Claim 79, wherein the processor is further configured to implement the function of determining a rate of learning.

82. (Previously Presented) The physiological training and evaluation simulator system of Claim 79, wherein the simulated physiological structure comprises a physiological control element configured to produce a simulated physiological response in the simulated physiological structure, the physiological control element being coupled with the controller via the conductive elastomer-based evaluation circuit, and wherein the controller is further configured to implement the function of controlling the physiological control element during the simulated procedure, such that the physiological control element produces a simulated physiological response during the simulated procedure that is consistent with the data provided to the controller by the conductive elastomer-based evaluation circuit.

83. (Original) The physiological training and evaluation simulator system of Claim 82, wherein the physiological control element is a pump, and the simulated physiological response is a movement of a fluid in the simulated physiological structure.

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Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314

84. (Original) The physiological training and evaluation simulator system of Claim 82, wherein the physiological control element is a servo, and the simulated physiological response is a movement of at least a portion of the simulated physiological structure.

85. (Original) The physiological training and evaluation simulator system of Claim 79, wherein the simulated physiological structure is a human patient simulator including a plurality of simulated anatomical features, thereby enabling the human patient simulator to support the simulation of a plurality of different simulated procedures.

86. (Original) The physiological training and evaluation simulator system of Claim 85, wherein the conductive elastomer-based evaluation circuit is distributed throughout at least a portion of the human patient simulator as a three-dimensional grid.

87. (Original) The physiological training and evaluation simulator system of Claim 85, wherein the conductive elastomer-based evaluation circuit is distributed throughout the human patient simulator as a neural network simulating a human nervous system.

LAW OFFICES OF RONALD M. ANDERSON
600 - 108th Avenue N.E., Suite 507
Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314